

REMARKS

Entry of the foregoing, reexamination and reconsideration of the application identified in caption, as amended, pursuant to and consistent with 37 C.F.R. § 1.111 and in light of the remarks which follow, are respectfully requested.

By the present Amendment, claim 1 has been amended to further define "a polymer." Support for this amendment can be found in the present specification at least in paragraph [0035], and original claims 2 and 4. Claim 3 has been amended to change its dependency to claim 1. Claims 5 and 7 have been rewritten in independent form. Support for these amendments can be found in paragraph [0013] of the specification. Claims 2 and 4 have been canceled without prejudice or disclaimer. New claims 23-27 have been added. Claims 23, 24 and 26 correspond to claim 8 and depend from claims 6, 7 and 3, respectively. Claims 25 and 27 are supported by the original disclosure, for example, paragraphs [0061], [0062] and [0066]. Specifically, in paragraphs [0061], [0062] and [0066] of the specification, it is disclosed that the polymer of the invention has characterized that the "content of single terminal vinyl group" is not less than 70%. "Content of single terminal vinyl group" means the proportion of the vinyl ($R=H$ in formula (7)) or vinylidene ($R=\text{hydrocarbon}$ in formula (7)) type double bond, as measured by 1H -NMR, in the low molecular weight ethylenic polymer having a double bond at one terminal, which is represented by the formula (7). When the polymer is epoxyfied, the value of the "content of single terminal proportion" is maintained as a value of the proportion of an end structure represented by the formula (8). This is further supported by the descriptions in Riddick et al., at col. 3, lines 11-44. It shows that the proportion of terminal double bond before epoxyfication and the proportion of epoxyfied substituents after epoxyfication are of the same value. Therefore, when the

epoxyfied polymer is subject to ring opening polymerization, the composition claimed in new claim 25 or 27 is obtained.

No new matter has been added. Upon entry of the Amendment, claims 1, 3 and 5-27 will be all the claims pending in the application.

I. Form PTO-1449

Applicants filed an Information Disclosure Statement with a Form PTO-1449 on May 7, 2010, subsequent to the issuance of the present Office Action. The Examiner is respectfully requested to initial and date the Form PTO-1449 and return a signed copy to Applicants in the next official communication.

II. Response to Rejection under 35 U.S.C. § 102(b)

Claims 1, 2, 4 and 8 were rejected under 35 U.S.C. § 102(b) as being anticipated by Japanese Patent Document No. 2003-292602 to Tsutomu et al. The Examiner has relied on an English machine translation of Tsutomu et al. Applicants respectfully submit that present claims 1 and 8 are novel over Tsutomu et al. for at least the following reasons.

Independent claim 1 recites a polymer having at least a structural unit represented by the Formula (1), and at least one structural unit selected from the group consisting of structural units represented by Formula (5) and Formula (6).

Tsutomu et al. discloses a polyester resin composition obtained by reacting polybutene having a structure represented by formula (1) and polyester. The polyester resin composition is a modified polyester having a structural unit of ethylene being bonded by olefin polymer, which corresponds to "A" in the Formula (1) recited in present claim 1, wherein a group is bonded to the both end of the ethylene unit through oxygen atom (a hetero atom).

On the other hand, present claim 1 recites that A is a polymer of ethylene or propylene, which does not include a polymer having a polyester structure. Accordingly, claim 1 is not anticipated by Tsutomu et al.

In view of the foregoing, Applicants respectfully submit that claim 1 as well as dependent claim 8 is novel and patentable over Tsutomu et al., and thus the rejection should be withdrawn.

III. Response to Rejections under 35 U.S.C. § 103(a)

a. Claims 1-3 and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,008,338 to Riddick et al. Applicants respectfully submit that present claims 1, 3 and 7 are patentable over Riddick et al. for at least the following reasons.

Riddick discloses a polymer having a structural unit corresponding to the Formula (1), wherein A is limited to a polymer of butene. However, Riddick does not disclose or suggest a polymer of the presently claimed invention, which has a structural unit represented by the Formula (1), wherein A is a polymer of ethylene or propylene.

In view of the foregoing, Applicants respectfully submit that claims 1 and 7 as well as dependent claim 3 are patentable over Riddick et al., and thus the rejection should be withdrawn.

b. Claims 1, 5 and 6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,811,483 to Close, with U.S. Patent No. 5,962,572 to Chen being provided as extrinsic evidence. Applicants respectfully submit that present claims 1, 5 and 6 are patentable over Close for at least the following reasons.

Close discloses a polymer having a structural unit corresponding to the Formula (1), wherein A is limited to a polymer of butene derivative. However, Close does not disclose or

suggest a polymer of the presently claimed invention, which has a structural unit represented by the Formula (1), wherein A is a polymer of ethylene or propylene.

In view of the foregoing, Applicants respectfully submit that claims 1 and 5 as well as dependent claim 6 are patentable over Close, and thus the rejection should be withdrawn.

IV. New Claims

Newly added claims 23-27 depend from claims 1, 5 and 7, respectively, and thus are patentable over the cited references for at least the reasons set forth above in Sections II and III.

Further, Riddick et al. discloses a polybutene comprising about 10% vinylidene or terminal double bonds and about 20% tetrasubstituted double bonds (col. 3, lines 31 to 34), and an epoxidized polybutene composition comprising about 70% trisubstituted epoxide, 20% tetrasubstituted and about 10% 1,1-disubstituted or monosubstituted epoxide (col. 3, lines 16 to 19).

On the other hand, claims 25 and 27 recite that "A" is a homopolymer of ethylene or a copolymer of ethylene and propylene. Therefore, the polymer recited in claims 25 and 27 is different from that described in Riddick et al.

Moreover, the structural unit of the presently claimed polymer contains a structure $-\text{CH}_2-$. To obtain a polymer containing a structure unit $-\text{CH}_2-$, it is necessary to have a structure having vinyl group $(-\text{CH}=\text{CH}_2)$ or vinylidene group $(>\text{C}=\text{CH}_2)$ at its end of the feed stock.

In addition, claims 25 and 27 recite that the amount of a polymer having the structural unit represented by the Formula (1) is not less than 70% based on the whole composition. As pointed out above, the present specification describes in paragraph [0066] that "the proportion of the vinyl or vinylidene type double bond, as measured by $^1\text{H-NMR}$, in the low

molecular weight ethylenic polymer of the invention (hereinafter, this proportion is referred to as the 'content of single terminal vinyl group') is 50% or more, more preferably 70% or more, and even more preferably 80% or more, of the total single terminals."

On the other hand, Riddick et al. discloses a feedstock having trisubstituted (>CH=C-) and tetrasubstituted (>C=C<) double bonds at its end as main ingredients, which means that total of trisubstituted and tetrasubstituted double bonds is 90%.

Therefore, Riddick et al. does not disclose and suggest the polymer of claims 25 and 27.

Regarding Close, the Examiner appears to consider that Amoco H-300, which is disclosed in Chen, is an epoxidized functional polybutene corresponding to the presently claimed invention.

Regarding Amoco H-300, U.S. Patent Application Publication No. 2004/0152841 discloses in paragraphs [0019] and [0024] as follows:

[0019] To establish the effectiveness of the enhanced PIB modifiers of the invention, a pressure sensitive adhesive was prepared using an Exxon Chemical high molecular weight polyisobutylene elastomer (Vistanex MML-120) as a base polymer, a Hercules polyterpene tackifier (Piccolyte S-115), toluene as a solvent, and an enhanced PIB modifier. A BPAmoco conventional polybutene (H-300) was used as a modifier in a comparative sample employed to compare the properties of a pressure sensitive adhesive formulated in accordance with the concepts and principles of the invention with the properties of a prior art pressure sensitive adhesive.

[0024] For comparative purposes, a similar pressure sensitive adhesive was produced using essentially the same methodology except that in this case a commercially available conventional polybutene (BPAmoco H-300) was used as the modifier instead of the TPC1160. BPAmoco H-300 is a conventional polybutene with *low vinylidene content (typically <10%)*. The M_N of the BPAmoco H-300 was about 1600 and its polydispersity was in the range of 1.8 to 2.0.

It is clear that AMOCO H-300 is different from the polymer recited in present claims 25 and 27.

IV. Conclusion

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at his earliest convenience.

The Director is hereby authorized to charge any appropriate fees under 37 C.F.R. §§ 1.16, 1.17 and 1.20(d) and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: July 26, 2010

By:



Fang Liu, Ph.D.

Registration No. 51283

Customer No. 21839
703 836 6620